

Wet Season Occupation of Workshop Jungle by Small Mammals

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Abstract

Small mammals at eight sites within Workshop Jungle, Fogg Dam Nature Reserve, were trapped over a 13 day period (2 080 trap nights) in the wet season of 1988/89. Three species were caught, in order of decreasing abundance, *Rattus colletti*, *Planigale maculata*, and *R. tunneyi*. Unlike *R. tunneyi* and *Planigale maculata*, the number of individuals of *R. colletti* was inversely related to elevation, possibly because this species forages in shallow flood water at the foot of the slope. Compared to Cape York the small mammal fauna of this forest is depauperate, and contains no rainforest specialists.

Introduction

Workshop Jungle is situated within the Fogg Dam Nature Reserve some 50 km south east of Darwin. It is a relatively large patch (about 2 km²) of monsoon forest that has been classified as a semi-deciduous notophyll vine forest on fluvial deposits (Kikkawa *et al.* 1981). Bowman & McDonough (1991) have made a detailed study of the spatial pattern of trees across the slight elevation gradient above the seasonally flooded sedgeland on the Adelaide River floodplain. Vegetation pattern on these sedgelands has been described by Bowman & Wilson (1986).

The seasonal dynamics of the herpetofauna and pig rooting of Workshop Jungle have been described by Martin & Freeland (1988) and Bowman & McDonough (unpubl. data) respectively. To date there have been no studies of other vertebrate groups in this jungle. To redress this imbalance we undertook a small mammal survey during the wet season of 1988-1989.

Methods

In the 13 day period from 23 December 1988 to 4 January 1989 small mammals were trapped in eight 50 x 50 m plots within Workshop Jungle. Plots were selected from a grid established by Bowman & McDonough (1991) to cover the full range of altitudinal variation within the monsoon forest. A 10 x 20 m quadrat was used to sample the total basal area, richness and stem density of woody species >2 m height within each plot. The entire grid was surveyed to determine the height above mean sea level of the south east corner of each plot relative to Australian height datum. Bores were established to find the height of the water table in February 1989.

The trapping regime consisted of four 20 m trap lines spaced 10 m apart. On each trap line five medium-sized Elliott traps were placed at 4 m intervals. Traps were baited with a mixture of peanut butter, oats and honey. Traps were checked at first light and rebaited and set each afternoon. Trapped animals were sexed,

TABLE 1 Pearson correlation coefficients between measured environmental variables and total number of individuals of the three small mammals caught at the eight sites at Workshop Jungle (* $p < 0.05$; ** $p < 0.001$; *** $p < 0.001$).

	Elevation	<i>R. colletti</i>	<i>R. tunneyi</i>	<i>P. maculata</i>
Elevation	1.00	-0.92 ***	0.21	0.16
Basal area of trees	-0.73 *	0.74 *	0.21	0.43
Density of trees	-0.71 *	0.73 *	-0.54	-0.24
Tree species richness	0.74 *	-0.58	0.35	0.14
Watertable depth	-0.88 **	0.81 *	-0.16	0.19

weighed and measured (tail, head and body length), their ears marked with numbered tags and then released.

Results

Three species of small mammals (two rodents and one dasyurid) were caught. *Rattus colletti* was the most abundant species ($n = 144$), while *Rattus tunneyi* ($n = 18$) and *Planigale maculata* ($n = 24$) had a similar and much smaller number of individuals (Fig. 1). There was no relationship between the number of *R. colletti* and the numbers of the other two species (*R. tunneyi*, $r = 0.24$, $p = 0.57$; *P. maculata*, $r = 0.03$, $p = 0.94$; $n = 8$ sites).

The number of *R. colletti* individuals was strongly related to the elevation of the plot (Fig. 1). Such a relationship was not apparent for the two other species of small mammal. Table 1 shows that elevation is related to all the other measured habitat variables, most of which are also correlated with number of *R. colletti*.

Discussion

Despite the intensive trapping effort only three species of mammal were captured. None of these are rainforest specialists: all are known to occur in a variety of other habitats in northern Australia (Strahan 1983). Detailed studies of *R. colletti* (Redhead 1979; Friend *et al.* 1988) and *P. maculata* (Taylor *et al.* 1982) show that they seasonally migrate up the elevation gradient from the sedgeland into surrounding habitats to avoid wet season flood waters. *Rattus colletti* prefers sites near to the edge of the flood waters, possibly so it can forage in shallow water (Williams 1983). The other two species appear to be randomly distributed through the monsoon forest.

The trapping occurred during a wet season with above average rainfall (Bowman & McDonough 1991). It is unclear what influence this has had on results of the study. For example, *Melomys burtoni* which has been previously recorded for this Jungle (K. Martin, J. Estbergs, pers. comm.) was not caught. Similarly it is known that *R. colletti* populations vary dramatically in response to rainfall events (Friend *et al.* 1988). These authors suggest that buffalo destocking may result in a wetland-forest transition that is more favourable for this species.

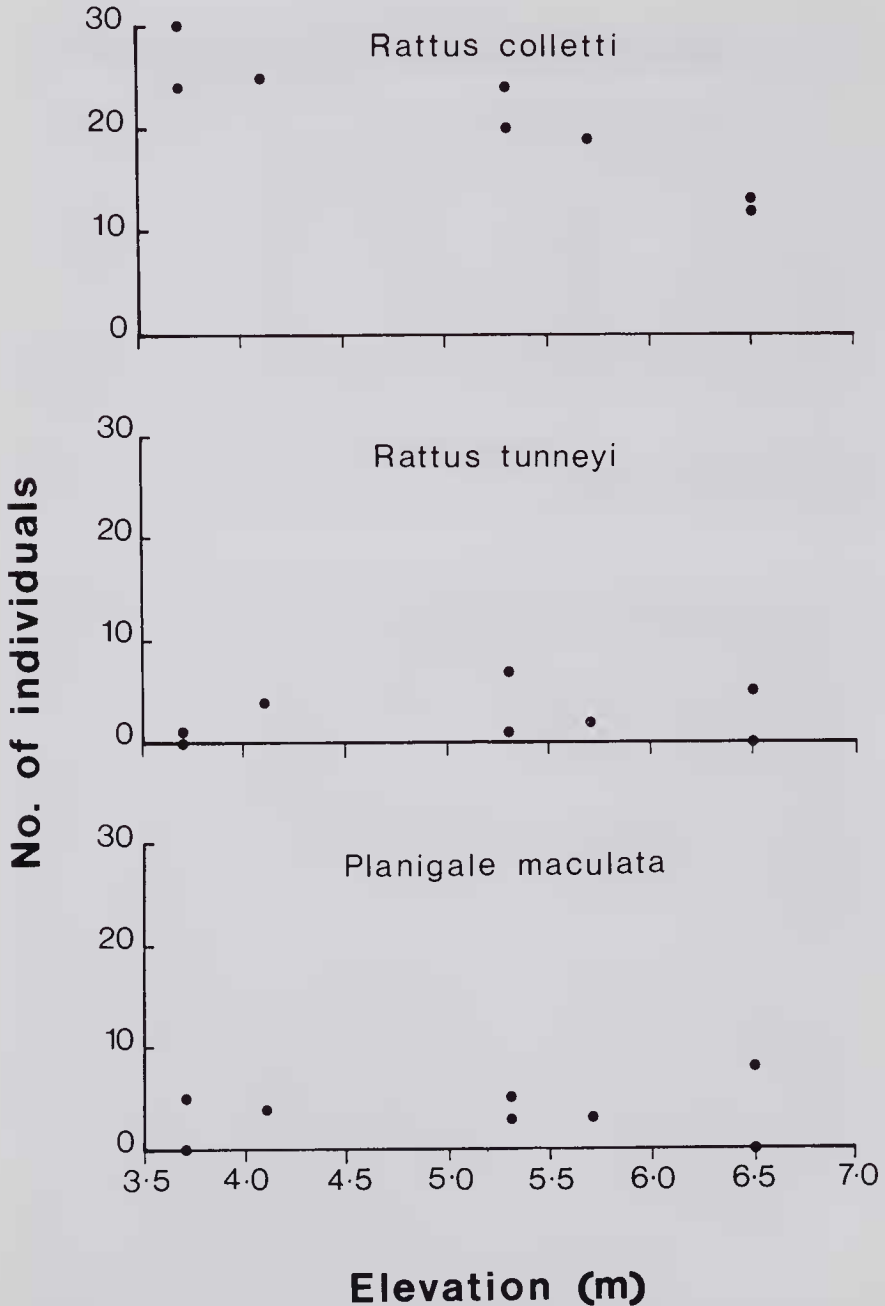


FIGURE 1 Relationship between elevation and the total number of individuals of the three species of small mammal caught at the eight sites within Workshop Jungle.

The Northern Territory is known to have few specialist rainforest vertebrates (Martin & Freeland 1988; Woinarski 1989). Winter (1988) reports that there are four small mammal rainforest specialists that occur on Cape York and suggests that this relative richness is most probably due to large areas of rainforest that provided refugia during periods of aridity, while in south-eastern Australia the rainforest pockets contracted below a critical size to support rainforest specialists. This argument might also explain the absence of rainforest specialists in the NT.

Acknowledgements

Matt Nichols trapped the animals; John Woinarski, Peter Whitehead, Bill Freeland, Keith Martin and John Estbergs made comments on the manuscript and the Joint Northern Territory-Federal Government Rainforest Conservation Program provided funds for this research. We thank them all.

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